



Bluezone™ Model 2400
Fresh Preservation Technology

**Installation,
Operation, and Service Manual**

Manual Created By:



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1. Description

The Bluezone™ Fresh Preservation Unit is a device that extends the shelf life and preserves the quality of fresh fruits and vegetables by removing ethylene and microbial load from the atmosphere of refrigerated spaces. The Bluezone™ Unit can be mounted to the ceiling of a refrigerated container (or walk-in), or located in the walk-in on a shelf, cart, or other structure. The Bluezone™ Unit draws in air containing impurities that can lead to rot or decay, and discharges air with a reduced concentration of these impurities.

The refrigerated space, produce and personnel have no contact with the process that is cleaning the air. The unit is capable of maintaining ethylene concentrations within refrigerated Fresh Fruits and Vegetable (FF&V) storage spaces below 0.5 PPM, thus extending the shelf life of the FF&V. The Bluezone™ Unit's operation is controlled by a microprocessor-based controller that ensures safe operation at all times and alerts the user to any system faults.

2. Specifications

The specifications of the Bluezone™ Model 2400 are shown in Table 1.

Table 1: Bluezone™ Model 2400 Specifications

Specification Category	Model 2400
Application	Storage Coolers/Walk-in Coolers
Size	31" X 12" X 12"
Weight	35 lbs.
Input Voltage	120 VAC 1 Phase
Current	2.75 amps (at 120VAC)
Power	300 watts
Refrigerated Volume Preserved with Unit	Up to 3500 Cubic Feet or 5 – 10 pallets of ethylene producing FF&V per Unit
Electrical Connection	Standard 120 VAC cord or Pig tail for direct wiring
Mounting Options:	Ceiling: 4 X 3/8 –16UNC bolts With Mounting Straps (provided)
Verification Testing	MIL-STD-461 (EMI) ASTM D999 and ASTM D5276

A photograph of the Model 2400 is shown in Figure 1.



Figure 1: Photograph of Model 2400 Bluezone™ Unit Ready for Installation in Cooler

3. Installation

The Bluezone™ Unit is mounted to the ceiling of most refrigerated spaces. Mounting is secured with four, 3/8" bolts. The unit must be mounted to structural members in the refrigerated-container ceiling or wall. Mounting straps (provided) or brackets must be used to allow the load to be distributed. Alternatively, the Bluezone™ Unit can be placed on a shelf or a cart in a walk-in refrigerator. The unit is then wired into a 120 VAC junction box.

A drawing of the mounting locations on the Model 2400 is provided in Figure 2. The mounting hardware includes vibration isolators.

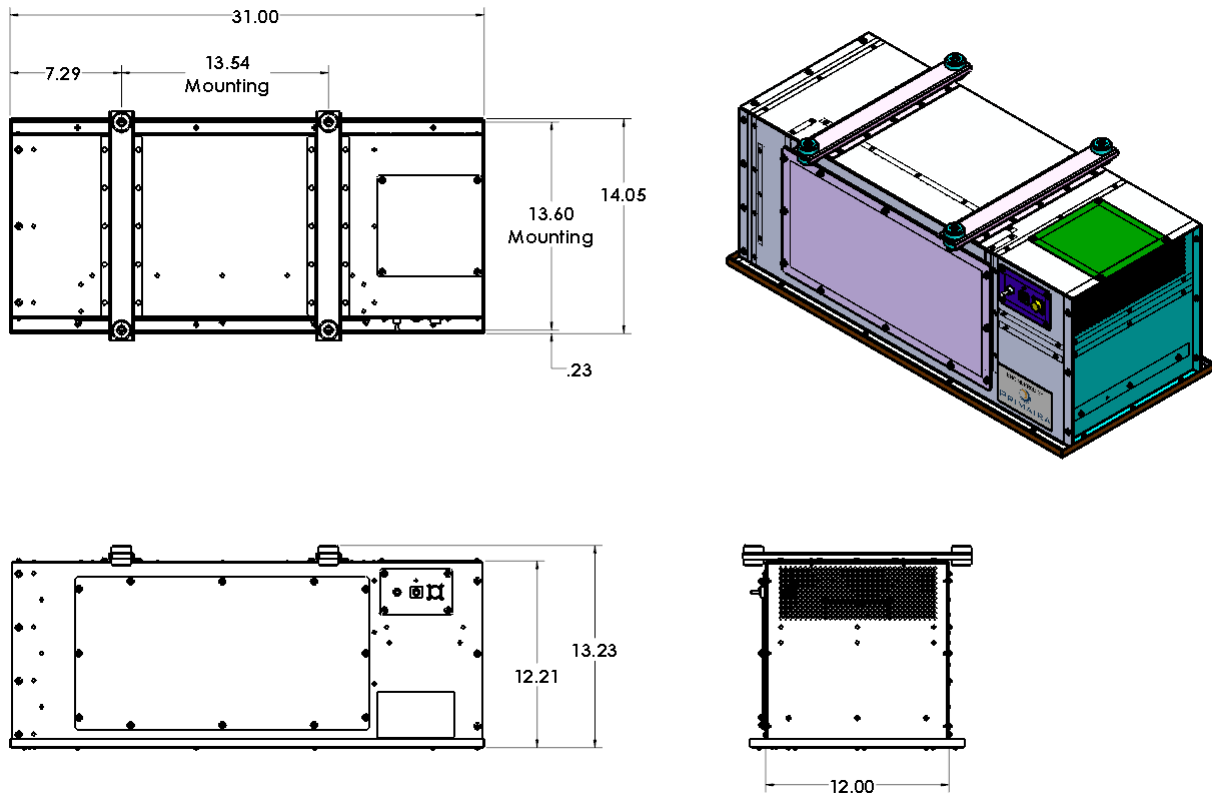


Figure 2: Model 2400 Bluezone™ Unit Mount Locations

A diagram illustrating installation is provided in Figure 3.

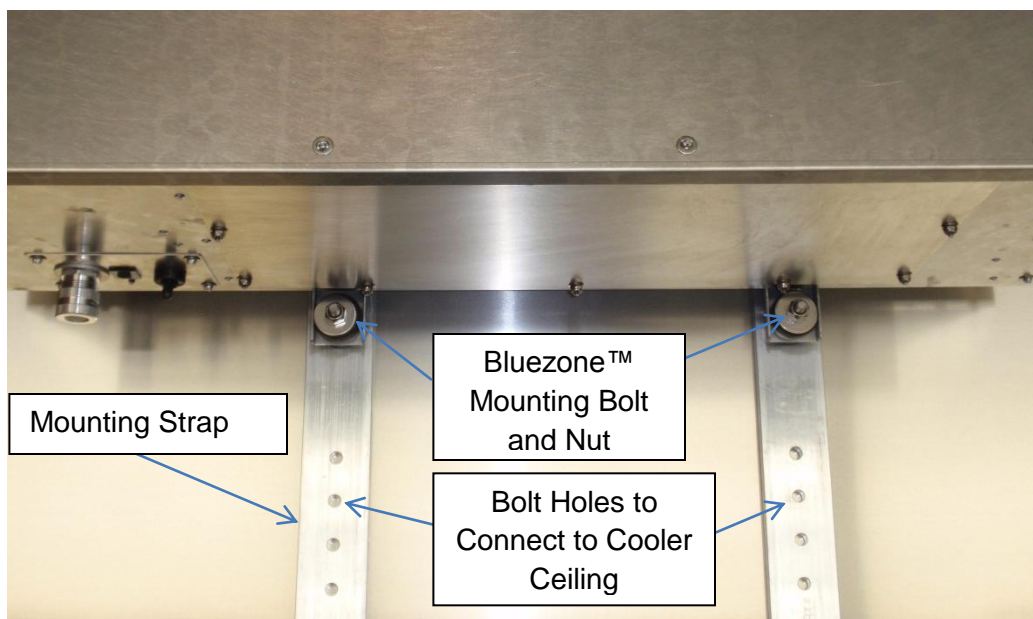


Figure 3: Illustration of Model 2400 Bluezone™ Unit Installed in Cooler

3.1 Installation Guidelines:

Each Bluezone™ Model 2400 unit has the capacity to handle 2000 – 4000 cubic feet of storage volume and 3 – 8 tons of mixed produce. If more than one Bluezone™ Model 2400 unit is being installed in the refrigerated space, the following are recommended guidelines for the placement of the Bluezone™ units:

1. Distribute the units relatively evenly throughout the space. Exact location of the units is not required to achieve the desired performance. Generally spreading the locations across the available space is good practice.
2. Locate the units near the outlets of the evaporators, so that the unit inlet and outlet flow is from/to air that will be well distributed throughout the cooler.
3. Orient the units so that the inlet/outlet is 90° from the outlet of the evaporator, if possible.
4. If the unit is aligned in the same direction as the air flow out of the evaporator, locate the unit approximately 1 foot from the evaporator outlet to avoid excessive flow through the Bluezone™ unit.
5. Install the units above head level, if possible. If there is risk of bumping the unit, it should be labeled with colored tape to reduce the risk of collision.
6. Locate the junction boxes for the units as close as possible to the units to avoid the risk of hooking the cord and pulling it out. If the cord is over 2' long it should be tied to the wall or ceiling to keep it protected.
7. Ceiling Mount: Locate installation chamber and structural members and position and secure the mounting straps in the correct location using 3/8" long bolts (multiple holes are provided to help align to structural members).

An Installation Check List is shown below:

Table 2: Installation Check List

	check
Bluezone™ Units are generally distributed throughout the refrigerated space.	<input type="checkbox"/>
Bluezone™ Units are located to avoid collision with forklifts or operators.	<input type="checkbox"/>
Bluezone™ Units are at least 1 foot from refrigerated air flow outlets.	<input type="checkbox"/>
Cords connecting Bluezone™ Units to junction boxes are tied tightly to ceiling or wall and do not hang loosely below the Bluezone™ Units.	<input type="checkbox"/>
Bluezone™ Units are positioned above head height.	<input type="checkbox"/>
If Bluezone™ Units are installed at or below head height; yellow attention tape is affixed to the edges of the unit.	<input type="checkbox"/>

Once the Model 2400 is mounted and wired, the switch in the control panel is toggled to “on” to energize the unit.

This switch is shown in Figure 4.

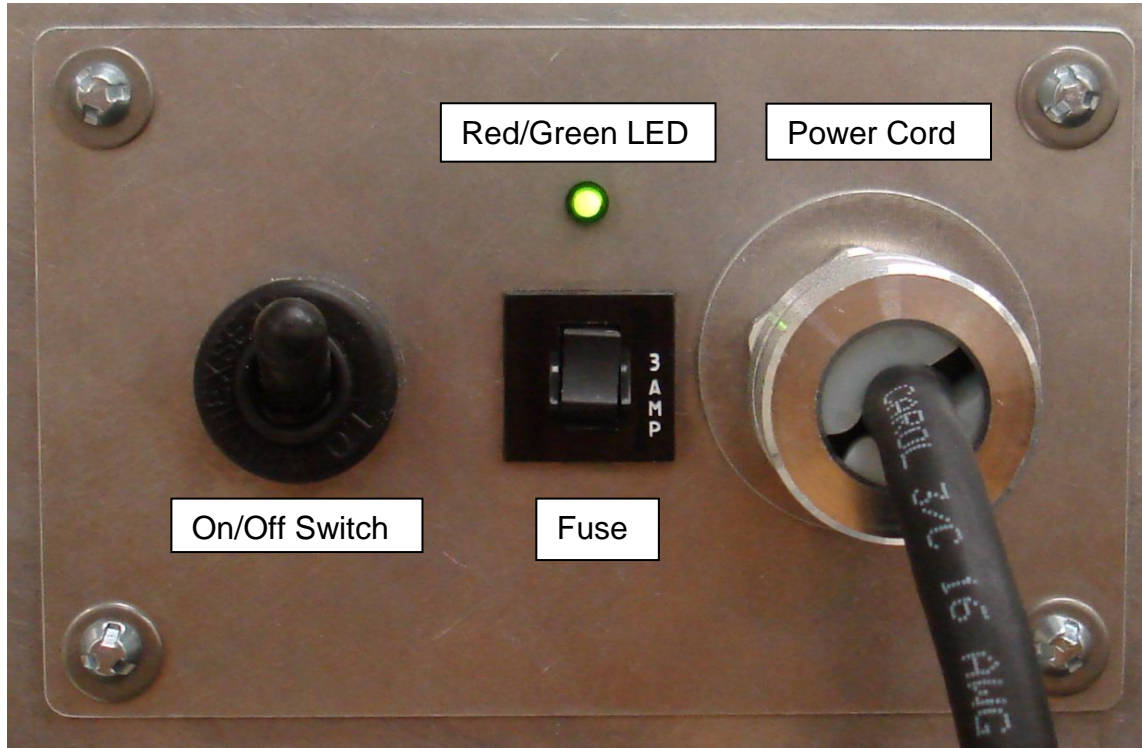


Figure 4: Control Panel on Bluezone™ Unit

4. Operation

Once the unit is installed and switched “On” a red LED indicator will briefly turn “On”. Within a short time, the indicator will turn to green, indicating that the system is operating properly. The LED indicator displays a combination of 4 states: 1 normal operation and 3 are fault mode. These fault codes are shown in Table 3. If the unit enters any of the fault states, the unit will automatically default to a fail-safe mode. Not all faults will shut off the operation of the unit.

Table 3: LED Indicator Fault Codes

Color	Description	Fault	Operation	Action to Take
Solid Green	System operating properly	OK	Operates	None
Solid Red Fan off	Fault Mode 1	Fan Error	Unit turns off	Contact Vendor for Replacement Unit
Solid Red Fan On	Fault Mode 2	Lamp Error	Unit continues to Operate	Replace Bulbs (see instructions below) Plan to replace bulbs on a yearly basis.
Flashing Green/Red Fan On	Fault Mode 3	Ozone Error	Bulbs off/Fan operates	Contact Vendor for Replacement Unit

5. Service

The bulbs are replaced on a yearly basis. A service kit and instructions are provided.

Service Kit includes:

- 4 U-shaped bulbs
- 4 zip ties
- 4 screws (for bulb locators): 5/16" Hex Head, 8-32 UNC x 1/2" Long
- 6 screws (for replacing cover screws in case some are dropped): Tri-grove screws 8-32 UNC x 3/8" Long
- 1 screw removal tool for cover and bulb locators
- 2 latex gloves

Additional tools needed:

- 1 wire snips tool

Instructions for bulb replacement:

- 1) Examine color of diagnostic light.
- 2) If diagnostic light is either solid Red or Flashing Red and Green, the unit needs to be replaced.
 - ⇒ Contact Vendor for Unit Replacement.
- 3) If the diagnostic light is green,
 - ⇒ Switch toggle switch to OFF.
- 4) Confirm that diagnostic control light is out.
- 5) Remove 14 screws on cover (See Figure 5) (take care not to lose screws)
- 6) Slowly, lower cover and place it on flat surface.
- 7) Place screws in the cover; these will be needed after bulbs are replaced.
- 8) Remove four screws holding both bulb support wires in place (see Figure 7)
 - ⇒ Place them in the cover; they will be used once the new bulbs are installed
- 9) Remove the bulb support wires
 - ⇒ Place them in the cover; they will be used once the new bulbs are installed
- 10) Cut the zip ties with the snips, throw pieces away (See Figure 8)
- 11) Remove bulbs by holding them on their ceramic ends and angling them slightly inward (until a hard “snap” is felt and the bulb releases from the receptacle). Pull them out of the receptacle.
 - ⇒ Put the bulbs to the side for disposal
- 12) To replace bulbs with ones provided in the service kit, first put on latex gloves provided to avoid putting oils from hand on the bulbs.
- 13) Install bottom bulbs first, then top bulbs.
- 14) Hold bulbs on the ceramic end and push the pins into the slots in the receptacle.
 - ⇒ They need to be pushed hard. A “click” will be heard and felt when the bulb is in place.
- 15) Thread the new zip ties provided around under the receptacle and around the ceramic end of the bulb, as shown in Figure 9. Insert the ziptie from the inside of the unit to the outside, threading it under the receptacle and back through the inside of the bulb. Pull tight.
- 16) Replace the bulb supports, making sure that the red rubber support is around the bulb.
 - ⇒ The two bulb support wires are different; use the support with the red rubber on the ends of the wire with the bulbs closest to the cover. Use the support with the red rubber on the 2nd and 4th loops of the support on the bulbs at the bottom of the unit.
 - ⇒ See Figure 6 for guidance.
 - ⇒ Use original screws to fasten. If these screws were lost, four additional screws are provided in the service kit.
- 17) Replace the cover using all 14 screws.
 - ⇒ Additional screws are provided.
- 18) Dispose of used bulbs, according to standard practice for florescent bulbs.

Estimated Total Bulb Replacement Time: Approximately 30 minutes per unit

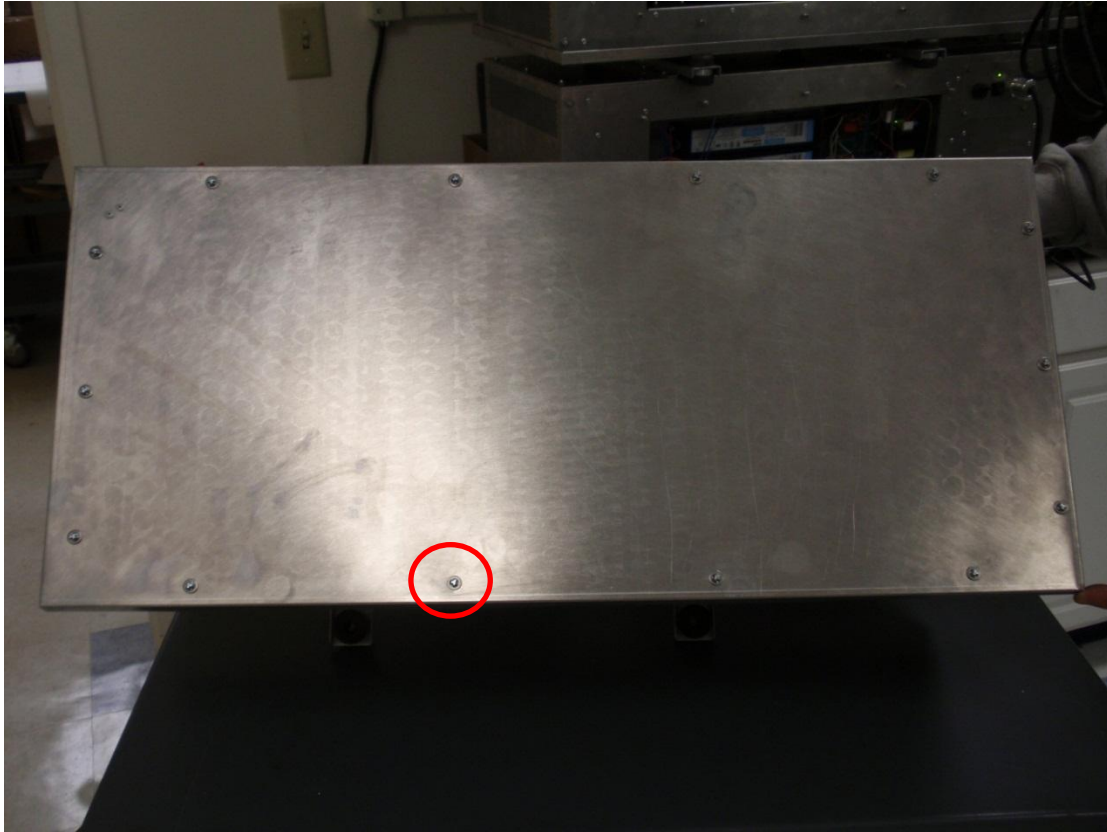


Figure 5: Cover and Cover Screws

Note: There are 14 Screws, Take Extra Precautionary Care to Not Lose the Screws

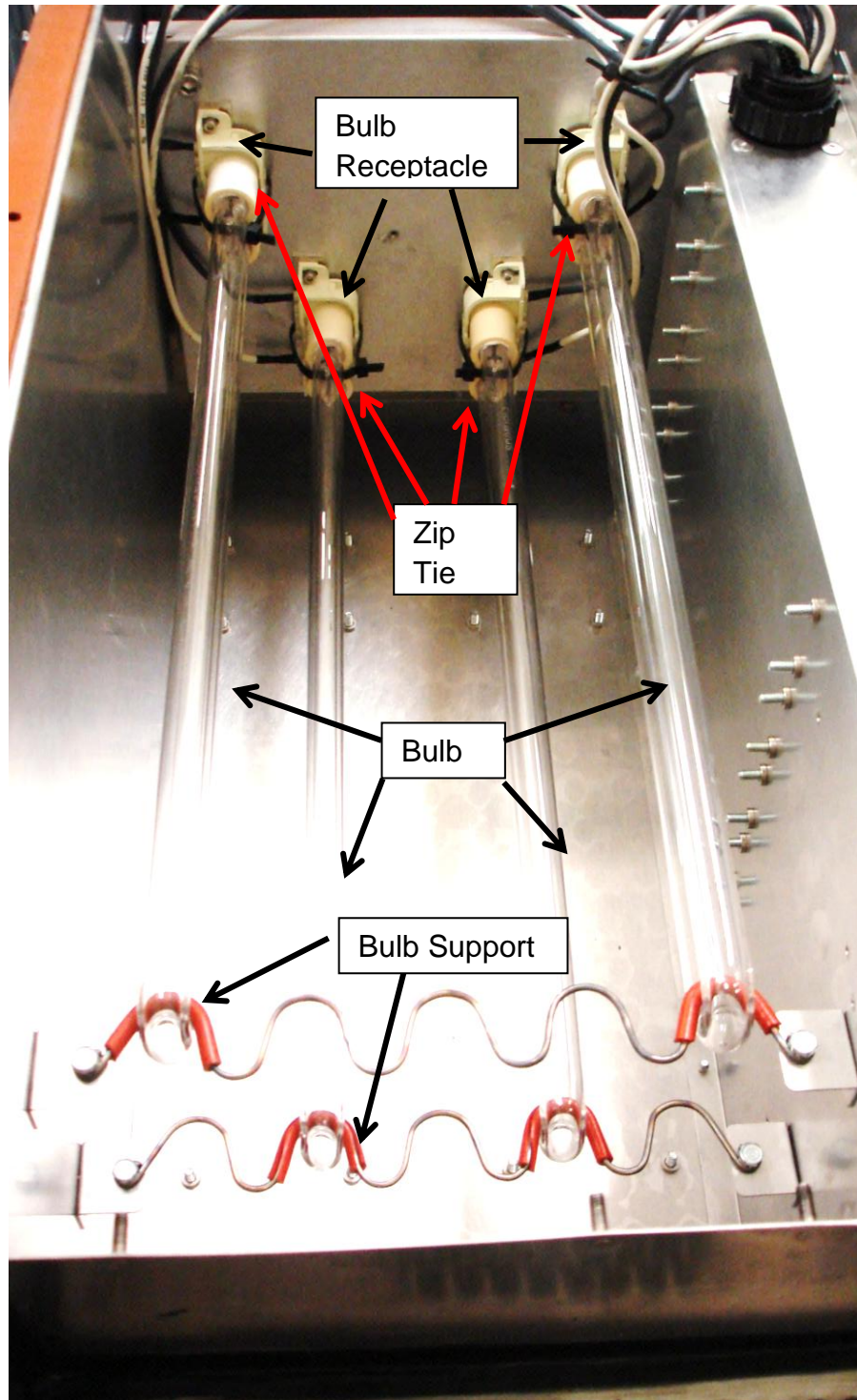


Figure 6: Bluezone™ Model 2400 with Cover Removed

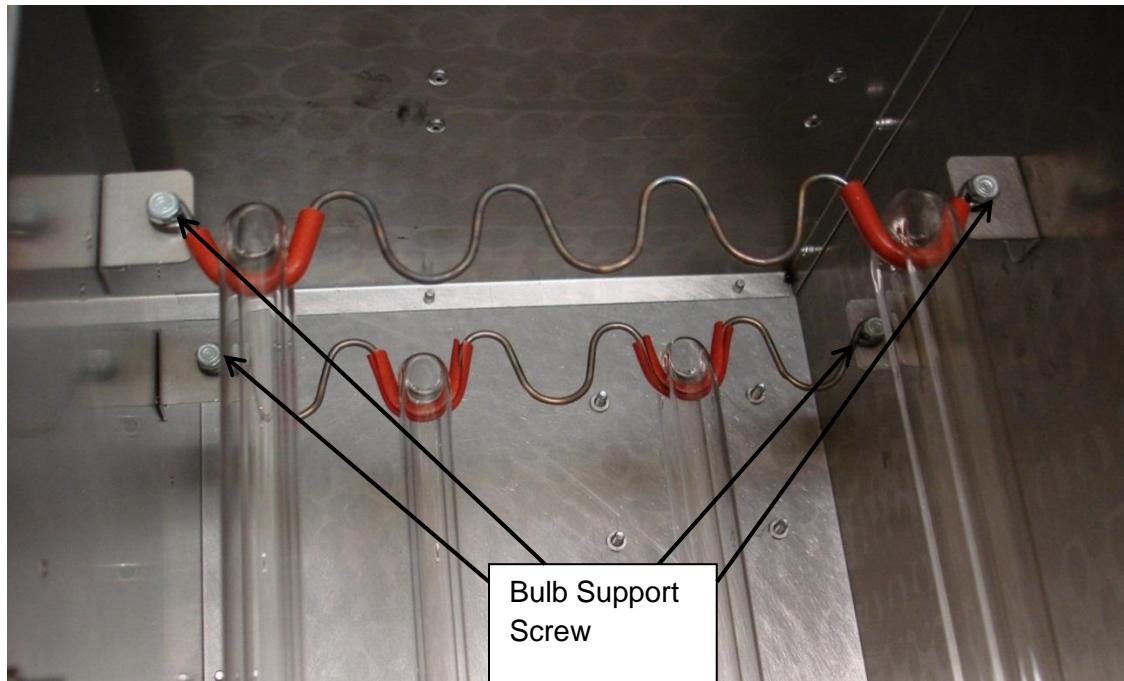


Figure 7: Bulb Supports

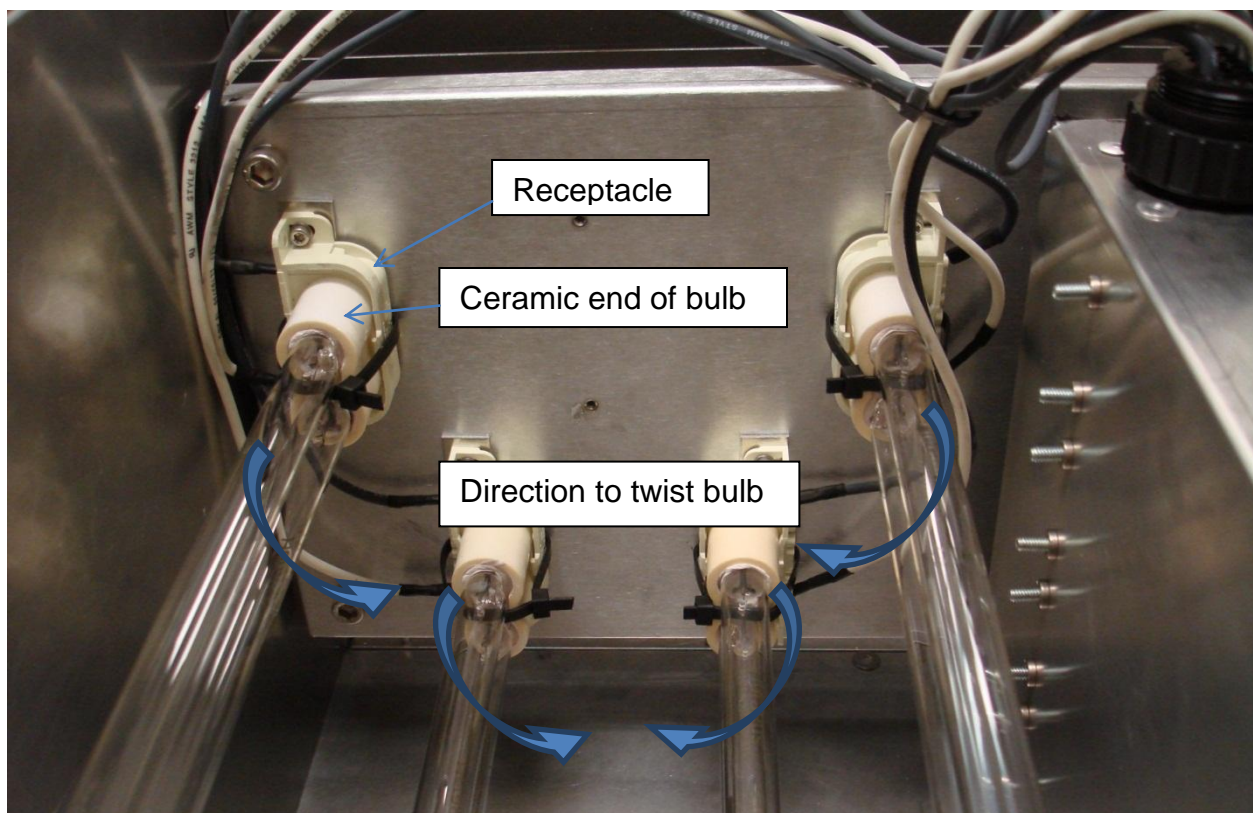


Figure 8: Bulbs Held in Receptacles with Zip Ties

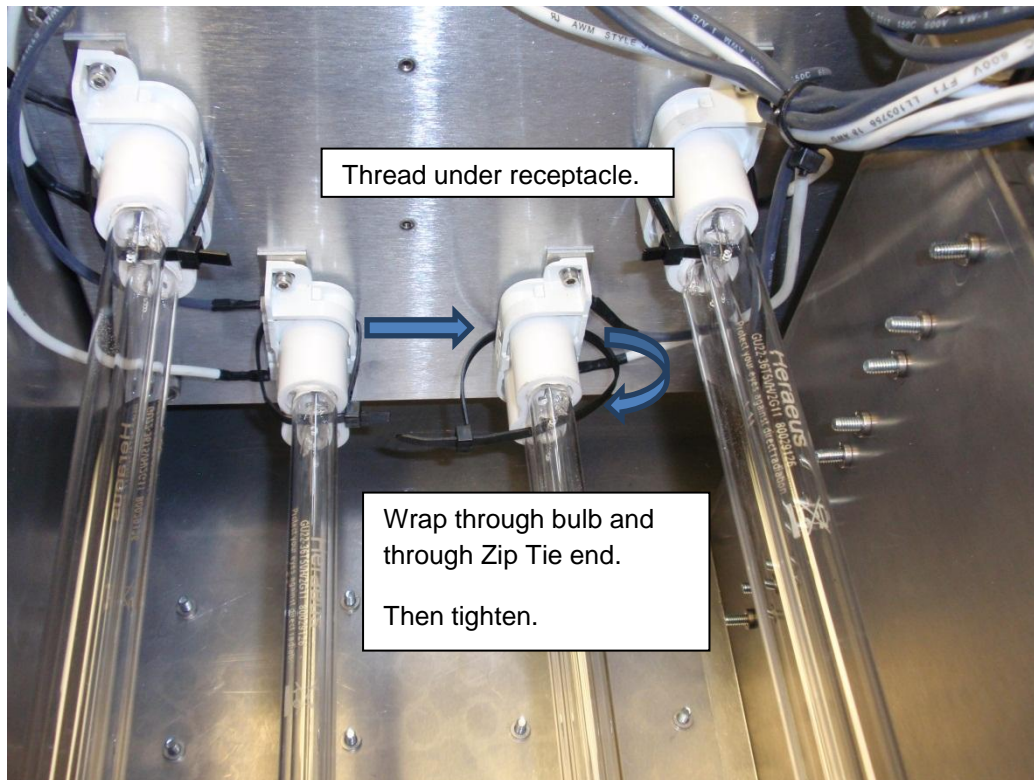


Figure 9: Illustration of Zip Tie Replacement

As shown in Table 3 above, if either the Red or Red/Green Flashing Diagnostic are lit, contact vendor for replacement unit.

Vendor Contact Information:

Technical Support is provided by:

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